Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

1.-74. (Cancelled).

75. (New) A transmitter for generating a hybrid spread-spectrum signal to transmit data bits, wherein each of the data bits has a data bit time, the transmitter comprising:

a pseudo-random code generator configured to generate a first stream of pseudo-random code words and a second stream of pseudo-random code words, wherein the first stream of pseudo-random code words and the second stream of pseudo-random code words are interrelated by a predetermined relationship;

a direct sequence generation circuit configured to receive the data bits to be transmitted and the first stream of pseudo-random code words, the direct sequence generation circuit configured to generate a direct sequence spread spectrum signal including a plurality of sub-sequences of chips for each of the data bits based upon the first stream of pseudo-random code words;

a programmable direct digital frequency synthesizer coupled to the pseudo-random code generator to receive the second stream of pseudo-random code words, the programmable direct digital frequency synthesizer configured to generate a carrier signal at a sequence of carrier frequencies for each of the data bits based upon a sequence of the pseudo-random code words of the second stream of pseudo-

random code words received by the programmable direct digital frequency synthesizer during each data bit time; and

a modulator in communication with the direct sequence generation circuit and the programmable direct digital frequency synthesizer, the modulator configured to modulate the carrier signal with the direct sequence spread spectrum signal to generate a direct sequence fast frequency hopped spread spectrum signal.

76. (New) The transmitter of claim 75, wherein the sequence of carrier frequencies generated by the programmable direct digital frequency synthesizer includes a first carrier frequency and a second carrier frequency;

wherein the direct sequence fast frequency hopped spread spectrum signal for each of the data bits includes at least a first sub-sequence of chips and a second subsequence of chips, and

wherein the carrier signal at the first carrier frequency is modulated by the first sub-sequence of chips and the carrier signal at the second carrier frequency is modulated with the second sub-sequence of chips.

77. (New) The transmitter of claim 75, wherein the first stream of the pseudo-random code words includes "n" bits per data bit time;

wherein the second stream of pseudo-random code words includes "m" frequency-hopping control words per data bit time; and

wherein n>m.

78. (New) The transmitter of claim 77, wherein "n" is an integer multiple of "m," and $n \geq 2 \times m$.

79. (New) The transmitter of claim 75, wherein the direct sequence fast frequency hopped spread spectrum signal corresponds to a respective data bit and includes a sub-sequence of chips for each frequency of the carrier signal used to transmit the respective data bit.

80. (New) The transmitter of claim 75, wherein the predetermined relationship that interrelates the first stream of pseudo-random code words and the second stream of pseudo-random code words is a first predetermined relationship;

wherein the pseudo-random code generator is further configured to generate a third stream of pseudo-random code words; and

wherein the third stream of pseudo-random code words is interrelated by a second predetermined relationship to the first stream of pseudo-random code words and the second stream of pseudo-random code words.

81. (New) The transmitter of claim 80, further comprising:

an amplification circuit in communication with the modulator, the amplification circuit configured to amplify the direct sequence fast frequency hopped spread spectrum signal to generate an amplitude controlled direct sequence fast frequency hopped spread spectrum signal based upon an amplification control signal.

82. (New) The transmitter of claim 81, further comprising

an amplitude control circuit in communication with the pseudo-random code generator and the amplification circuit, the amplitude control circuit configured to dither the amplification control signal based upon the third stream of pseudo-random code words.

83. (New) The transmitter of claim 80, wherein the first predetermined relationship and the second predetermined relationship are selected from among a group comprising direct subsets of bits of the pseudo-random code generator, rolling code segments of the pseudo-random code generator, scrambling of code vectors of the pseudo-random code generator, and table-based reassignments of bit-pattern relationships of the pseudo-random code generator,, or a combination thereof.

84. (New) The transmitter of claim 80, wherein the pseudo-random code generator is further configured to generate a pseudo-random coincidence gate control signal that is interrelated to both the first stream of pseudo-random code words, the second stream of pseudo-random code words, and the third stream of pseudo-random code words by a third predetermined relationship, the transmitter further comprising:

a coincidence gate coupled between the modulator and the amplification circuit, the coincidence gate configured to receive the pseudo-random coincidence gate control signal from the pseudo-random code generator; and

the coincidence gate further configured to time gate the direct sequence fast frequency hopped spread spectrum signal based upon the pseudo-random coincident gate control signal.

85. (New) The transmitter of claim 80, wherein the first predetermined relationship, the second predetermined relationship and the third predetermined relationship are selected from the group comprising direct subsets, rolling code segments, scrambling of code vectors and table-based reassignments of the bit-pattern relationships, or a combination thereof.

86. (New) The transmitter of claim 75, wherein the pseudo-random code generator is further configured to generate a pseudo-random coincidence gate control signal;

the transmitter further comprising:

a coincidence gate in communication with the modulator and the pseudo-random code generator, the coincidence gate configured to receive the direct sequence fast frequency hopped spread spectrum signal and the pseudo-random coincidence gate control signal from the pseudo-random code generator; and

wherein the coincidence gate is configured to time gate the direct sequence fast frequency hopped spread spectrum signal based upon the coincident gate control signal to generate a time hopped direct sequence fast frequency hopped spread spectrum signal.

87. (New) The transmitter of claim 86, wherein the predetermined relationship that interrelates the first stream of pseudo-random code words and the second stream of pseudo-random code words is a first predetermined relationship; and

wherein the pseudo-random coincidence gate control signal is interrelated to both the first stream of pseudo-random code words and the second stream of pseudo-random code words by a fourth predetermined relationship.

88. (New) The transmitter of claim 87, wherein the fourth predetermined relationship that interrelate the first stream of pseudo-random code words and the second stream of pseudo-random code words is selected from a group comprising direct subsets of bits of the pseudo-random code generator, rolling code segments of the pseudo-random code generator, scrambling of code vectors of the pseudo-random code generator, and table-based reassignments of bit-pattern relationships of the pseudo-random code generator, or a combination thereof.

89. (New) The transmitter of claim 75, wherein the modulator is a balanced modulator.

90. (New) The transmitter of claim 75, wherein the programmable direct digital frequency synthesizer is further configured to receive a band select input signal; and

wherein the programmable direct digital frequency synthesizer is further configured to generate the carrier signal within a frequency band as a function of the second stream of pseudo-random code words and the band select input signal.

91. (New) A transmitter for generating an electromagnetically polarized hybrid spread spectrum signal to transmit data bits, the transmitter comprising:

a pseudo-random code generator configured to generate a first stream of pseudo-random code words and a second stream of pseudo-random code words, wherein the first stream of pseudo-random code words and the second stream of pseudo-random code words are interrelated by a predetermined relationship;

a programmable direct digital frequency synthesizer coupled to the pseudo-random code generator to receive the second stream of pseudo-random code words, the programmable direct digital frequency synthesizer configured to directly generate a carrier signal having a carrier frequency based upon the second stream of pseudo-random code words, and wherein in response to the second stream of pseudo-random code words, the programmable direct digital frequency synthesizer is further configured to hop the carrier frequency of the carrier signal during a data bit time for each of the data bits, wherein multiple carrier frequency hops occur within each data bit time;

a balanced modulator in communication with the programmable frequency direct digital synthesizer, the modulator configured to receive a direct sequence spread spectrum signal generated with the second stream of pseudo-random code words, and the balanced modulator further configured to generate a fast frequency

hopped direct sequence spread spectrum signal as a function of the carrier signal having multiple carrier frequency hops during each data bit time as a function of the first stream of pseudo-random code words;

a first antenna having a first polarization, the first antenna in communication with the balanced modulator, the first antenna configured to emit the fast frequency hopped direct sequence spread spectrum signal as a first fast frequency hopped direct sequence spread spectrum signal with the first polarization; and

a second antenna having a second polarization, the second antenna in communication with the balanced modulator, the second antenna configured to emit the fast frequency hopped direct sequence spread spectrum signal as a second fast frequency hopped direct sequence spread spectrum signal with the second polarization.

92. (New) The transmitter of claim 91, wherein the predetermined relationship is selected from among a group comprising direct subsets of bits of the pseudo-random code generator, rolling code segments of the pseudo-random code generator, scrambling of code vectors of the pseudo-random code generator, and table-based reassignments of bit-pattern relationships of the pseudo-random code generator, or a combination thereof.

93. (New) The transmitter of claim 91, further comprising:

a splitter coupled between the balanced modulator and the first antenna, and the splitter also coupled between the balanced modulator and the second antenna, wherein the splitter is configured to split the fast frequency hopped direct sequence spread spectrum signal into a first signal and a second signal; and

wherein the first signal is emitted by the first antenna as the first fast frequency hopped direct sequence spread spectrum signal and the second signal is emitted by the second antenna as the second fast frequency hopped direct sequence spread spectrum signal.

94. (New) The transmitter of claim 91, further comprising:

a first RF amplifier coupled between the balanced modulator and the first antenna, the first RF amplifier configured to amplify the first fast frequency hopped direct sequence spread spectrum signal with a first amplification level; and

a second RF amplifier coupled between the balanced modulator and the second antenna, the second RF amplifier configured to amplify the second fast frequency hopped direct sequence spread spectrum signal with a second amplification level.

95. (New) The transmitter of claim 94, further comprising:

the pseudo-random code generator further configured to generate a third stream of pseudo-random code words; and

an amplitude controller coupled to the pseudo-random code generator, the amplifier controller in communication with the first RF amplifier and the second RF

amplifier, wherein the amplifier controller is configured to dither the first amplification level and the second amplification level as a function of the third stream of pseudo-random code words.

96. (New) The transmitter of Claim 95, wherein the predetermined relationship that interrelates the first stream of pseudo-random code words and the second stream of pseudo-random code words is a first predetermined relationship; and

wherein the first stream of pseudo-random code words, the second stream of pseudo-random code words, and the third stream of pseudo-random code words are interrelated by second predetermined relationship.

97. (New) The transmitter of claim 96, wherein the first predetermined relationship and the second predetermined relationship are selected from among a group comprising direct subsets of bits of the pseudo-random code generator, rolling code segments of the pseudo-random code generator, scrambling of code vectors of the pseudo-random code generator, and table-based reassignments of bit-pattern relationships of the pseudo-random code generator, or a combination thereof.

98. (New) The transmitter of claim 91, wherein the first amplification level and the second amplification level are dithered at a rate greater than a reflection coefficient of a multipath condition.

99. (New) The transmitter of claim 91, further comprising:

a first RF amplifier coupled between the balanced modulator and the first antenna, the first RF amplifier configured to amplify the first fast frequency hopped direct sequence spread spectrum signal with a first amplification level;

a second RF amplifier coupled between the balanced modulator and the second antenna, the second RF amplifier configured to amplify the second fast frequency hopped direct sequence spread spectrum signal with a second amplification level; and

an amplitude controller coupled to the pseudo-random code generator, the amplitude controller in communication with the first RF amplifier and the second RF amplifier, wherein the amplitude controller is configured to adjust the first amplification level relative to the second amplification level to maintain a relative power ratio between the first fast frequency hopped direct sequence spread spectrum signal and the second fast frequency hopped direct sequence spread spectrum signal.

100. (New) The transmitter of claim 89, wherein the direct sequence fast frequency hopped spread spectrum signal for each of the data bits includes at least a first sub-sequence of chips and a second subsequence of chips;

wherein the sequence of carrier frequencies includes a first carrier frequency and a second carrier frequency; and

wherein the carrier signal at the first carrier frequency is modulated by the first sub-sequence of chips and, subsequently, the carrier signal at the second carrier frequency is modulated by the second sub-sequence of chips.

101. (New) The transmitter of claim 91, wherein the first stream of the pseudo-random code words includes "n" bits per data bit time;

wherein the second stream of pseudo-random code words includes "m" frequency-hopping control words per data bit time; and

wherein $n>m$.

102. (New) The transmitter of claim 101, wherein "n" is an integer multiple of "m," and $n \geq 2\times m$.

103. (New) The transmitter of claim 91, wherein the first polarization and the second polarization are linearly polarized.

104. (New) A transmitter capable of generating a fast frequency hybrid spread-spectrum signal to transmit a plurality of data bits, each of the data bits having a data bit time, the transmitter comprising:

a pseudo-random code generator configured to generate a first stream of pseudo-random code words, a second stream of pseudo-random code words, and a third stream of pseudo-random code words, wherein pseudo-random code words included in the first stream of pseudo-random code words, the pseudo-random code

words included in the second stream of pseudo-random code words, and the pseudo-random code words included in third steam of pseudo-random code words are interrelated by a predetermined relationship;

a direct sequence generation module in communication with the pseudo-random code generator, the direct sequence generation module configured to receive the data bits to be transmitted and the first stream of pseudo-random code words, the direct sequence generation module further configured to generate a plurality of chips as a plurality of sub-sequences of chips for each of the received data bits based upon the first stream of pseudo-random code words;

a programmable direct digital frequency synthesizer in communication with the pseudo-random code generator to receive the second stream of pseudo-random code words, the programmable direct digital frequency synthesizer configured to generate a carrier signal based upon the second stream of pseudo-random code words;

wherein in response to the second stream of pseudo-random code words, the programmable direct digital frequency synthesizer is further configured to hop the carrier signal during each data bit time of each of the respective data bits, wherein multiple carrier frequency hops occur within each data bit time to generate a plurality of pseudo-random carrier frequencies as a sequence of carrier frequencies;

a balanced modulator in communication with the direct sequence generation circuit and the direct programmable frequency synthesizer, the balanced modulator configured to modulate the carrier signal with chips, wherein for each of the pseudo-random carrier frequencies, the carrier signal is modulated by a respective sub-

sequence of the chips of the plurality of sub-sequences of chips, to generate a fast frequency hopped direct sequence spread spectrum signal; and

a coincidence gate coupled to the pseudo-random code generator and the balanced modulator, the coincidence gate configured to gate the fast frequency hopped direct sequence spread spectrum signal as a function of the third stream of pseudo-random code words to generate a time hopped fast frequency hopped direct spread spectrum signal.

105. (New) The transmitter of claim 104, wherein the pseudo-random code generator is further configured to generate a fourth stream of pseudo random code words, wherein the pseudo random codes words of the first stream, the second stream, the third stream, and the fourth stream are functionally interrelated by a known relationship, the transmitter further comprising:

an amplifier in communication with the coincident gate and configured to receive the time hopped fast frequency hopped direct sequence spread spectrum signal, wherein the amplifier is further configured to amplify the time hopped fast frequency hopped direct sequence spread spectrum signal based upon an amplification control signal; and

an amplitude controller including an amplitude control input coupled to the pseudo-random code generator to receive the fourth stream of pseudo random code words, and the amplitude controller further including the amplification control signal in communication with the amplifier, wherein the amplitude controller is further configured to dither the amplification of the time hopped fast frequency

hopped direct sequence spread spectrum signal based upon in response to the fourth stream of pseudo random code words.

106. (New) The transmitter of claim 104, wherein the first stream of pseudo-random code words, the second stream of pseudo-random code words, and the third stream of pseudo-random code words are interrelated by a polynomial relationship which is also known at a receiver of the time hopped fast frequency hopped direct spread spectrum signal.

107. (New) A method for generating a hybrid spread spectrum signal to transmit a plurality of data bits, wherein each of the data bits has a data bit time, the method comprising:

generating a first stream of pseudo-random code words with a pseudo-random number generator;

generating, with the pseudo-random number generator, a second stream of pseudo-random code words that are functionally interrelated to the first set of pseudo-random code words by a predetermined relationship;

generating a spread spectrum signal that includes a plurality of sub-sets of chips, each of the sub-sets of chips including at least three chips, for each of the data bits to be transmitted based upon the first stream of pseudo-random code words;

generating, with a programmable direct digital frequency synthesizer, a plurality of carrier signals, each of the carrier signals having a pseudo-random carrier frequency, based upon the second stream of pseudo-random code words; and

modulating each of the carrier signals with a respective sub-set of chips from among the plurality of sub-sets of chips to generate a fast frequency hopped spread spectrum signal.

108. (New) The transmitter of claim 107, wherein generating the first stream of pseudo-random code words with the pseudo-random number generator further comprises:

generating a "n" bit pseudo-random codeword per data bit time; and

wherein generating the second stream of pseudo-random code words that are functionally interrelated to the first set of pseudo-random code words by the predetermined relationship further includes:

generating "m" frequency-hopping control words per data bit time; and

wherein n>m.

109. (New) The transmitter of claim 107, wherein "n" is an integer multiple of "m," and $n \geq 2\times m$.

110. (New) The method of claim 107, further comprising:

generating a third stream of pseudo-random code words; and

dithering an amplitude of the fast frequency hopped spread spectrum signal as a function of the third stream of pseudo-random code words.

111. (New) The method of claim 110, further comprising:

interrelating the first stream of pseudo-random code words, the second stream of pseudo-random code words, and the third stream of pseudo-random code words based upon a predetermined relationship.

112. (New) The method of claim 110, wherein the predetermined relationship that interrelate the first stream of pseudo-random code words, the second stream of pseudo-random code words, and the third stream of pseudo-random code words are selected from a group comprising direct subsets of bits of the pseudo-random code generator, rolling code segments of the pseudo-random code generator, scrambling of code vectors of the pseudo-random code generator, and table-based reassignments of bit-pattern relationship of the pseudo-random code generator, or a combination thereof.

113. (New) The method of claim 110, further comprising:

generating a fourth stream of pseudo-random code words; and

time gating the dithered fast frequency hopped spread spectrum signal as a function of the fourth stream of pseudo-random code words to generate a hybrid spread spectrum signal.

114. (New) The method of claim 110, wherein generating the fourth stream of pseudo-random code words further comprises:

interrelating the fourth stream of pseudo-random code words to the first stream of pseudo-random code words and the second-pseudo-random code words based upon the predetermined relationship.

115. (New) The method of claim 114, wherein generating the third stream of pseudo-random code words further comprises:

interrelating the third stream of pseudo-random code-words to the first stream of pseudo random code words, the second stream of pseudo-random code words, and the fourth stream of pseudo-random code-words based upon the predetermined relationship.

116. (New) The method of claim 110, wherein the spread spectrum signal is a direct sequence spread spectrum signal.

117. (New) The method of claim 107, further comprising:

generating an additional stream of pseudo-random code words; and

time gating the fast frequency hopped spread spectrum signal as a function of the additional stream of pseudo-random code words to generate a hybrid spread spectrum signal.

118. (New) The method of claim 107, wherein the additional stream of pseudo-random code words are also interrelated to the first stream of pseudo-random code words, the second stream of pseudo-random code words by the predetermined functional relationship.

119. (New) The method of claim 107, wherein the first stream and the second stream of pseudo-random code words are functionally interrelated by one or more relationships selected from a group comprising direct subsets of bits of the pseudo-random code generator, rolling code segments of the pseudo-random code generator, scrambling of code vectors of the pseudo-random code generator, and table-based reassignments of bit-pattern relationships of the pseudo-random code generator, or a combination thereof.

120. (New) The method of claim 119, wherein the spread spectrum signal is a direct sequence spread spectrum signal.

121. (New) The method of claim 107, further comprising:

generating a pseudo-random dither control signal;

splitting the fast frequency hopped spread spectrum signal into a first component and a second component, wherein the first component and the second component have substantially identical signal power; and

dithering an amplitude of at least one of the first component and the second component to control a polarization between the first component and the second component based upon the pseudo-random dither control signal.

122. (New) The method of claim 121, wherein dithering the amplitude of at least one of the first component and the second component to control the polarization between the first component and the second component further comprises:

controlling a power level of the first component and a power level of the second component to optimize signal diversity between the first component and the second component.

123. (New) The method of claim 107, further comprising:

transmitting the fast frequency hopped spread spectrum signal from a radio frequency tag.

124. (New) The method of claim 107, wherein the spread spectrum signal is a direct sequence spread spectrum signal.

125. (New) A method for transmitting data bits in a high multipath environment with a hybrid spread spectrum signal, the method comprising:

generating a stream of pseudo-random codes comprising a plurality of bits;

generating within a data bit time, with a programmable direct digital frequency synthesizer, a plurality of carrier signals, each of the carrier signals

having a respective pseudo-random carrier frequency as a function of a first subset of bits of the stream of pseudo-random codes; and

modulating each of the carrier signals generated during the data bit time, as a function of a second subset of bits of the stream of pseudo-random codes, with a plurality of sub-segments of chips;

generating a direct sequence fast frequency hopped spread spectrum signal, wherein each of the sub-segments of chips modulates one of the plurality of carrier signals.

126. (New) The method of claim 125, further comprising:

splitting the direct sequence fast frequency hopped spread spectrum signal into a first direct sequence fast frequency hopped spread spectrum signal and a second direct sequence fast frequency hopped spread spectrum signal;

linearly polarizing the first direct sequence fast frequency hopped spread spectrum signal and the second direct sequence fast frequency hopped spread spectrum signal;

transmitting the first direct sequence fast frequency hopped spread spectrum signal with a first antenna having a first polarization; and

transmitting the second direct sequence fast frequency hopped spread spectrum signal with a second antenna having a second polarization.

127. (New) The method of claim 125, further comprising:

interrelating the first subset of bits and second subset of bits are based upon a predetermined relationship to be used at the receiver configured to receive the direct sequence fast frequency hopped spread spectrum.

128. (New) The method of claim 127, further comprising:

splitting the direct sequence fast frequency hopped spread spectrum signal into a first direct sequence fast frequency hopped spread spectrum signal and a second direct sequence fast frequency hopped spread spectrum signal;

linearly polarizing the first direct sequence fast frequency hopped spread spectrum signal and the second direct sequence fast frequency hopped spread spectrum signal;

transmitting the first direct sequence fast frequency hopped spread spectrum signal with a first antenna having a first polarization; and

transmitting the second direct sequence fast frequency hopped spread spectrum signal with a second antenna having a second polarization.

129. (New) The method of claim 128, wherein transmitting the first direct sequence fast frequency hopped spread spectrum signal with the first antenna and transmitting the second direct sequence fast frequency hopped spread spectrum signal with the second antenna further comprises:

dithering an amplitude of at least one of the first direct sequence fast frequency hopped spread spectrum signal and the second direct sequence fast frequency hopped spread spectrum signal.

130. (New) A method of claim 128, wherein transmitting the first direct sequence fast frequency hopped spread spectrum signal with the first antenna and transmitting the second direct sequence fast frequency hopped spread spectrum signal with the second antenna further comprises:

generating a first amplitude control signal and a second amplitude control signal based upon the stream of pseudo-random codes;

modulating an amplitude of the first direct sequence fast frequency hopped spread spectrum signal based upon the first amplitude control signal; and

modulating an amplitude of the second direct sequence fast frequency hopped spread spectrum signal based upon the second amplitude control signal.

131. (New) The method of claim 130, wherein the transmitted first direct sequence fast frequency hopped spread spectrum signal and the transmitted second direct sequence fast frequency hopped spread spectrum signal have a combined power level, the method further comprising:

controlling the first amplitude control signal relative to the second amplitude control signal to maintain a desired emitted power level envelope of the combined power level.

132. (New) The method of claim 130, wherein modulating the amplitude of the first direct sequence fast frequency hopped spread spectrum signal based upon the first amplitude control signal and modulating the amplitude of the second direct

sequence fast frequency hopped spread spectrum signal based upon the second amplitude control signal further comprises:

dithering the amplitude of the first direct sequence fast frequency hopped spread spectrum signal and the amplitude of the second direct sequence fast frequency hopped spread spectrum signal at a rate at least equal to an estimated rate of successively received reflected signals.

133. (New) The method of claim 125, further comprising:

generating a coincident gate control signal based upon a third subset of the bits of the stream of pseudo-random codes; and

gating transmission of the first direct sequence fast frequency hopped spread spectrum signal and the second direct sequence fast frequency hopped spread spectrum signal based upon the coincident gate control signal to time hop the transmitted first direct sequence fast frequency hopped spread spectrum signal and the transmitted second direct sequence fast frequency hopped spread spectrum.

134. (New) The method of claim 133, further comprising:

interrelating the first subset of bits of the pseudo-random codes, the second subset of bits of the pseudo-random codes, and the third subset of bits of the pseudo-random codes based upon a known relationship.

135. (New) The method of claim 133, wherein at least two of the first subset of bits, the second subset of bits and the third subset of bits are programmably related

by one or more relationships selected from a group comprising direct subsets of bits of the pseudo-random code generator, rolling code segments of the pseudo-random code generator, scrambling of code vectors of the pseudo-random code generator,, and table-based reassignments of bit-pattern relationships of the pseudo-random codes of the pseudo-random code generator, or a combination thereof.

136. (New) A method for transmitting data in a high-multipath environment, the method comprising:

generating a first stream of pseudo-random codes having a first sequence length based upon predetermined interrelationships between the first stream of pseudo random codes, a second stream of pseudo-random codes and a third stream of pseudo random codes;

generating the second stream of pseudo-random codes having a second sequence length that is longer than the first sequence length based upon the predetermined interrelationships;

generating a third stream of pseudo-random codes based upon the predetermined interrelationships;

generating multiple carrier frequencies within a data bit time with a programmable direct digital frequency synthesizer based upon the first stream of pseudo-random codes to produce a fast frequency hopped carrier signal;

generating a direct sequence spread spectrum signal representative of the data based upon the second stream of pseudo-random codes;

modulating the fast frequency hopped carrier signal with the direct sequence spread spectrum signal to form a fast frequency hopped direct sequence spread spectrum signal; and

gating the fast frequency hopped direct sequence spread spectrum signal based upon the third stream of pseudo random codes to generate a hybrid spread spectrum signal.

137. (New) The method of claim 136, wherein generating multiple carrier frequencies within the data bit time with the programmable direct digital frequency synthesizer based upon the first stream of pseudo-random codes to produce a fast frequency hopped carrier signal further comprises:

frequency sweeping the programmable direct digital frequency synthesizer to generate the fast frequency hopped carrier signal.

138. (New) The method of claim 136, further comprising:

modulating an amplitude of the hybrid spread spectrum signal based upon a fourth steam of pseudo-random codes.

139. (New) The method of claim 136, wherein the predetermined relationships that interrelate the respective codes of the first stream of pseudo random codes, the second stream of pseudo random codes, and the third stream of pseudo random codes are selected from a group comprising direct subsets of bits of the pseudo-random code generator, rolling code segments of the pseudo-random code generator,

scrambling of code vectors of the pseudo-random code generator, and table-based reassignments of bit-pattern relationships of the pseudo-random code generator, or a combination thereof.

140. (New) The method of claim 136, further comprising:

splitting the hybrid spread spectrum signal into a plurality of component signals, wherein each of the component signals is substantially identical in amplitude; and

modulating the amplitude of at least one of the plurality of component signals to control polarization of plurality of components based upon at least one pseudo-random sequence of amplitude control words.